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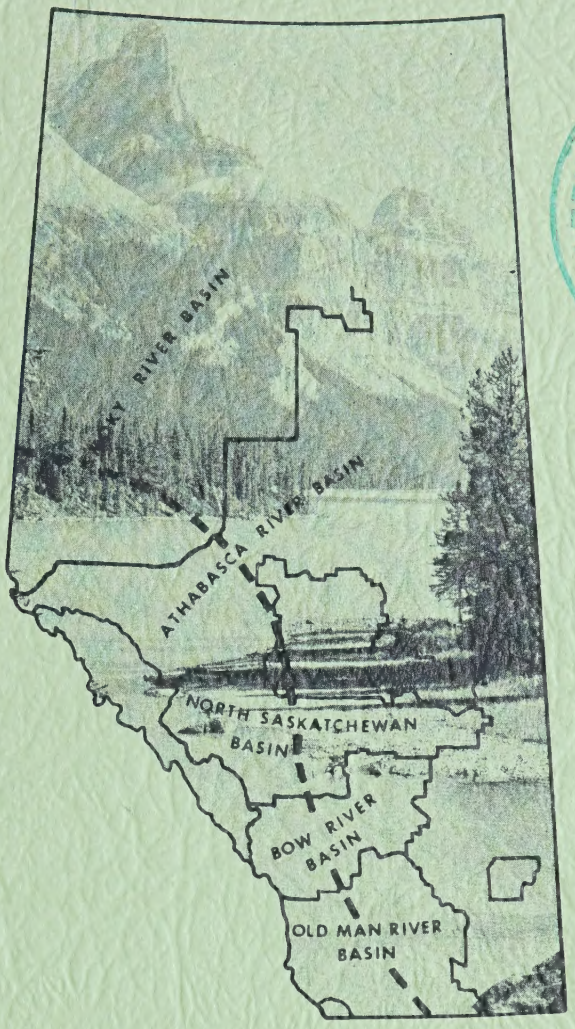

LAND USE
and
RESOURCES DEVELOPMENT
in the
EASTERN SLOPES

REPORT BY THE SCIENCE ADVISORY AD HOC
COMMITTEE ON THE EASTERN SLOPES

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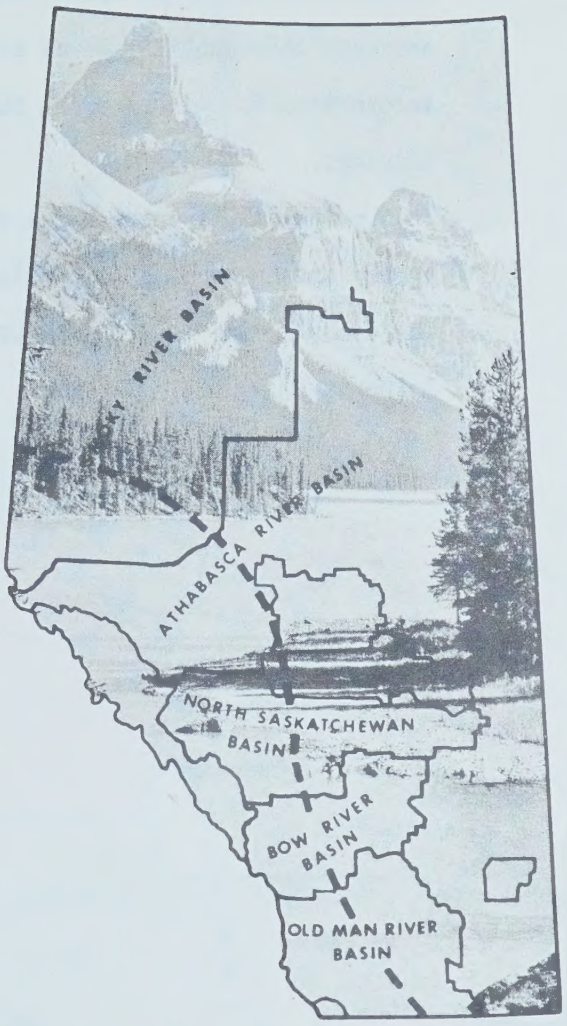

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The Environment Conservation Authority presents this publication as background information for its upcoming public hearings.

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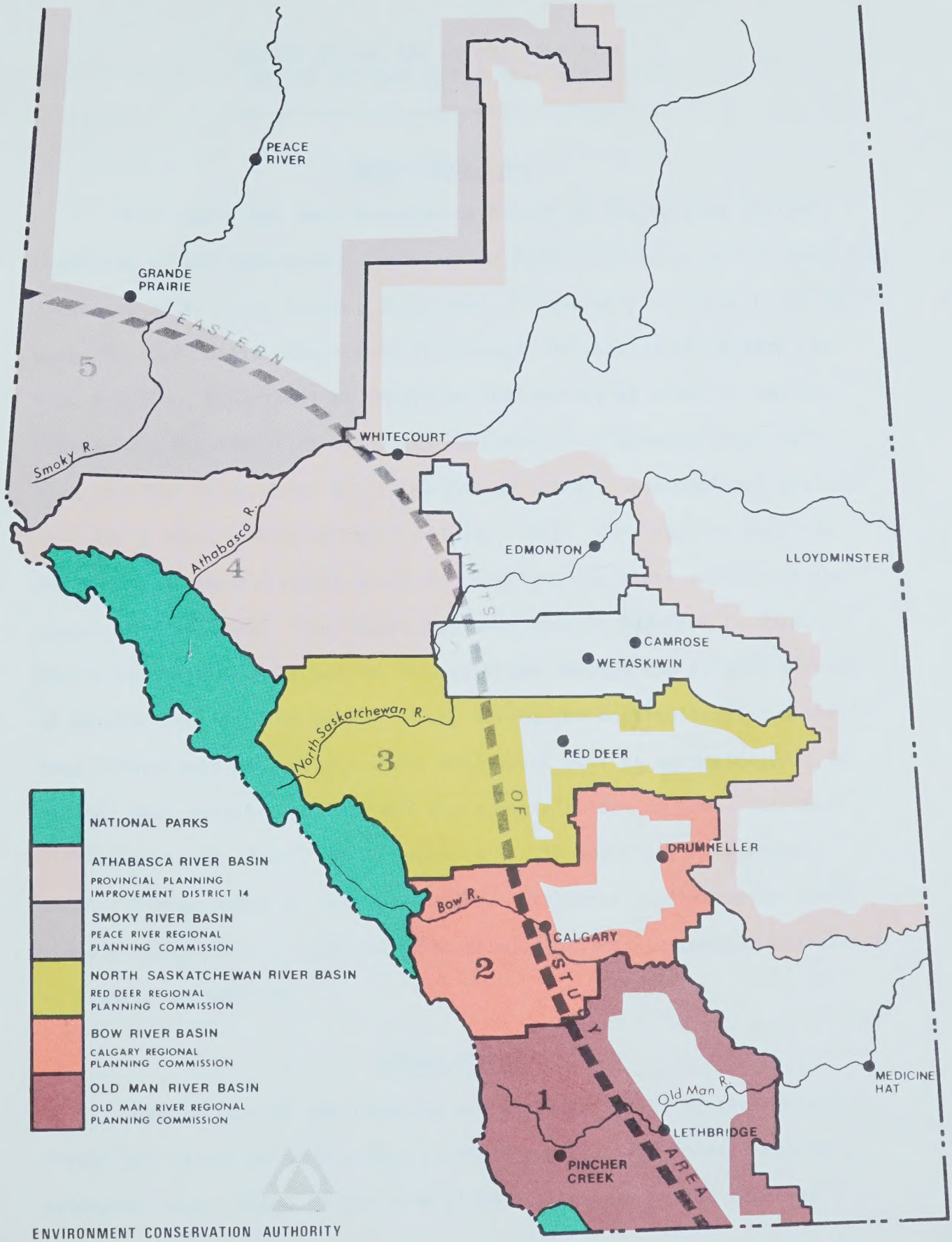

ENVIRONMENT CONSERVATION AUTHORITY
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REPORT OF THE SAC AD HOC COMMITTEE ON THE EASTERN SLOPES HEARINGS

ACKNOWLEDGEMENTS

This report has been prepared on behalf of the Science Advisory Committee of the Environment Conservation Authority, by an ad hoc committee comprised of Dr. L.D. Cordes, Department of Geography, University of Calgary, Dr. L.V. Hills, Department of Geology, University of Calgary, Dr. R.G. Ironside, Department of Geography, University of Alberta, and Dr. P.J. Smith, Department of Geography, University of Alberta (chairman). Miss Jennifer McQuaid and Mr. Frank Pearce acted as professional assistants for a short period in April and May, 1973. They were responsible for the basic data collection and for drafting the first version of the report which follows. The report has been greatly modified in later drafts but Miss McQuaid and Mr. Pearce broke through the initial barrier of marshalling ideas on paper. Also, during the data collection phase, they interviewed many people whose assistance must be acknowledged. It has not been possible to list all these contributors by name, but their affiliations are identified in Appendix I. In addition, Miss McQuaid and Mr. Pearce spoke to many people who contributed as interested individuals rather than as spokesmen for an agency: their anonymous assistance is greatly appreciated.

INTRODUCTION

Descriptions of the location and characteristics of the Eastern Slopes region are to be provided in other reports, and so will not be attempted here. There is one general point, however, which deserves

emphasis. From superficial acquaintance, it would be easy to conclude that the Eastern Slopes region is an homogeneous entity. It is equated, in most people's minds, with the foothills of the Rocky Mountains which, in turn, projects a simple, popular image of hills and trees, deer and fish. The reality, of course, is very different. The region is varied and complex, both environmentally and in its human use. It is very much to be hoped that this variety and complexity will be adequately revealed during the course of the public hearings. It quickly became evident to the members of the ad hoc committee that their resources of time and staff were insufficient to take on this task themselves. It also became evident, however, that there are many people, including many in government service, who are already highly knowledgeable about the Eastern Slopes region, and have devoted a great deal of professional attention to it. The public hearings will lose much of their potential value if these people are not heard from, freely and openly.

Another fact, which quickly made itself evident, may also run counter to the popular image. Although the amount of permanent settlement in the Eastern Slopes region is small, much of the region is used in some way or another, and often in competing ways. It is already a very valuable region to the people of Alberta, but its greatest value is still in the future. It has an impressive array of highly-regarded resources, and lies just west of the province's population and economic axis. Such propinquity leads inevitably to pressures on the resource base, to disturbance, disruption and conflicts of interest. Yet the pressures of the present are as nothing compared to the pressures which the region

is likely to have to bear in the future. It is inevitable that increasing demands should be put on its resources, an inevitability that is all too apparent to those who have been close observers of the region for even the past ten or twenty years. It is by no means too soon to implement a comprehensive, integrated management plan for the whole region and all its resources.

From this perspective, the ad hoc committee felt that they could best make two contributions:

(i) to provide a general statement of concepts of resource and land use planning which should be recognized and realized in any plan for the Eastern Slopes region; and

(ii) to attempt to identify the most critical of the use conflicts which now exist in the Eastern Slopes region. On the one hand, these represent problems which must be resolved in any plan; on the other hand, they are portents of an ever more pressing future.

SOME GENERAL CONCEPTS OF RESOURCE AND LAND USE PLANNING

The following concepts of resource use and management are relevant wherever the need for planning is admitted. They apply with equal force to private and public resource responsibilities, but they should be adhered to as a matter of course in those situations in which publicly-owned resources are involved. The central principle is inviolable: the resources must be managed for the maximum benefit of the people for whom they are held in trust. In the case of the Eastern Slopes region, this is the people of Alberta, both the present people and those who will follow.

(i) "Resource" is a man-made concept. A resource does not exist until it is needed to satisfy a human desire: it is derived from the economic, social or psychological values which are held at a particular place and a particular time.

(ii) Many areas have experienced a succession of resource uses, witnessed most obviously in the form of land use changes. These have resulted from human ingenuity, from changing needs and values, from the exhaustion of a resource and, sometimes, from the effects of natural processes. Because a resource is used in a particular way at a particular time is no guarantee that it will or should continue to be used in that way.

(iii) Conservation of resources is mainly a problem of determining the wisest long-term use. The balance between present and future requirements is particularly critical. In the case of renewable resources, the central principle is clear: management policies must be designed to ensure that the resource will be continuously renewed, with no decline in quality. For non-renewable resources, two different principles apply. Some resources (e.g. unique wildlife habitats) have value only as long as they are maintained without change: in such cases, conservation is equated with preservation. Other resources (e.g. minerals) have no value until they are changed: for these, conservation means ensuring that the maximum benefit is extracted from the resource before its ultimate exhaustion.

(iv) When resource use is being planned it is necessary to know the type or types of resources which are available; their quality, extent, location and expected life under different rates of use; whether they are

renewable or non-renewable; and the nature of any competition or conflicts in demand. A classification scheme, and detailed maps and projections, are therefore required.

(v) Most resource use problems ignore the existing pattern of political boundaries. If at all possible, then, new spatial units should be established so that the resource problems may be embraced within a single jurisdiction.

(vi) Land is a relatively fixed resource in terms of its extent. It also forms the basis for many other resources, which must therefore be regarded as spatially finite. When this fact is coupled with the facts of population increase, and urban increase in particular, the seeds of conflict are very evident. In simple terms, more and more people are competing for the right to use a fixed resource. This generates conflicts among the owners and users of privately-owned resources, between owners and non-owners, and between private and government interests. It seems inevitable that the tempo of these conflicts should quicken. The use of planning mechanisms to alleviate or prevent them must become increasingly urgent.

(vii) Cost-benefit analysis, for all its admitted deficiencies, is an indispensable tool in resource evaluation. The calculation of economic costs and benefits is now reasonably straightforward. The real difficulties concern the weighting of social costs and benefits, particularly those that are currently non-quantifiable. With increasing scarcity, however, and the increasing importance of non-economic values (e.g. the demand for wildlife and wildland preservation), more refined techniques

are being developed to aid in the critical judgments which have to be made among resource use alternatives.

(viii) There is a fundamental difference between commercial and governmental attitudes towards resource use planning. Commercial interests are usually assumed to have short planning perspectives and high return expectations, with some notable exceptions. Public authorities, on the other hand, are expected to take a long-term view, and to protect the common good from private cupidity. The expectation is not often fulfilled but that does not reduce its legitimacy. Nor are the two attitudes necessarily in conflict. Long-term management for the common good may also enhance the private gain, in both short and long terms, without unduly restricting the freedom of action which is implicit in the private enterprise system. The main freedom which is constrained is the freedom to be wasteful and irresponsible in the use of resources.

(ix) Today's society is the custodian of resources for future societies. The planning process is the means by which this stewardship is effected, if there is the essential political support for conservation and resource use planning. This point needs to be stressed. There have been many attempts at planned regional development to remedy disparities in standards of living. The legislation was passed, the techniques to implement remedial programs were devised, but the political will to make them succeed was lacking. The majority of these programs have thus failed. This can also happen in the resource planning field unless there is unreserved government support.

(x) Land ownership, even when it includes resources on or under the land, refers only to part of the bundle of rights which is embraced by the term "land tenure." The senior government for the area normally reserves some rights to itself, and invariably does so in Canada. What a land-owner has, therefore, is not the land itself but an amalgam of rights over the land, recognized by law as property. The rights which the sovereign government retains - including those of eminent domain, escheat, policing, taxation, and pollution and development control - always supersede those of the individual owner. At the same time, rights of arbitration, compensation and appeal are normally provided by legislation, for those situations in which an individual may experience economic or other loss in the public interest.

From these concepts of resource use planning, a number of goals can be discerned:

(i) to secure the orderly and optimal development of resources;

(ii) to minimize conflicts in resource use, among groups and individuals, and between them and the general public interest;

(iii) to maximize the public welfare; and

(iv) to protect individual rights and freedoms to the greatest extent which is consistent with the long-term public interest in the context of multiple resource use planning.

SOME USE CONFLICTS IN THE EASTERN SLOPES REGION

Grazing

Grazing is one of the principal land uses of the Eastern Slopes region. Over 100,000 acres are leased by various grazing associations,

to provide supplementary range for cattle, horses and, in the past, sheep. The management of these leases is the responsibility of the Alberta Forest Service, which restricts the number of livestock which can be permitted in any area on the basis of an estimated carrying capacity. This takes account of such things as the quality of the range, past experience with grazing in the area, and the needs of ungulate wildlife. Some forest reserve areas are excluded from livestock grazing, if excessive conflict with ungulates or human recreation may occur.

In gross terms, through the operation of the carrying capacity controls, over-grazing does not occur in the Eastern Slopes. When the grazing patterns are analyzed in detail, however, evidence of serious localized problems does emerge. It has been suggested, for example, that livestock allocations are sometimes exceeded, and that more rigorous policing of the grazing regulations is required. It has also been suggested that the allocations are too high in some instances. The most serious problem, though, is one of maldistribution of livestock within the grazing allotments: the allocation is not excessive if the entire allotment receives optimum grazing, but the animals tend to congregate in certain favoured situations. This, too, is primarily a policing problem. The regulations specify that the livestock must be dispersed but, not unnaturally, they tend to drift into those areas (such as valley bottoms) where there is good shelter and easy grazing. In some instances, the maldistribution is temporal as well as spatial. If, for example, cattle are allowed onto the leases too early in the spring, and are allowed to remain on them too late in the fall, the possibility that the range will have to be shared with ungulates is enhanced. The risk of competition between the animal populations, leading to localized over-grazing, is

therefore greatest at the extremities of the season. Competition for higher summer pasturage in the alpine meadows is less severe, because cattle seldom graze there. At the same time, however, the alpine environment is easily disturbed and any competition between wild and domesticated ungulates can lead to serious damage.

The active conflicts generated by livestock grazing are principally with biotic and watershed management. They can take a variety of forms. The extent and quality of grazing land available to wild ungulates may be reduced; overgrazing, particularly on open exposed slopes and terraces in the early spring, may lead to destruction of the vegetative cover, and thus to accelerated erosion which, in turn, decreases the likelihood of plant regeneration; trampling by hoofed animals can also lead to the destruction of plant cover, and to excessive compaction of the soil which, in its turn, leads to increased run-off; springs, seepage hollows and stream banks may be damaged by excessive trampling; and the sediment loads of streams are increased, with a consequent reduction in water quality,excessive siltation and damage to fish spawning grounds. There are other potential land uses which are hindered, and sometimes impossible, in the grazing leases. Some forms of recreation, for example, particularly intensive recreation, are almost completely incompatible with grazing. In some instances, the grazing allotments become, in effect, single-use regions. Such interests as wildlife and watershed management may be recognized in the government's regulations, but they may not necessarily correspond with the graziers' attitudes.

On the positive side, many grazing areas are well managed, with no evidence of conflicts or overgrazing, or the problems that can stem

from them. Grazing can also be a management tool: the risk of forest fires, for example, can be reduced if livestock are used to control the accumulation of forest litter and the growth of understorey.

The available evidence does not suggest that livestock grazing is an improper use in the Eastern Slopes region. Nor does it appear that the present grazing regulations are deficient. The problems, where they occur, are management and enforcement problems. Through such techniques as more restricted grazing seasons, the use of more range riders, and the active dispersal of livestock (e.g. by reducing herd sizes, by providing more frequent salt licks, and by making more use of temporary drift fences to control stock movements), grazing conflicts and overgrazing could probably be eliminated. Closer and more detailed monitoring of the environmental effects of grazing in known problem areas should also be carried on. Management should have the capability to react almost instantaneously to signs of environmental deterioration, by reducing the approved livestock allocation, for instance, or by prohibiting grazing in specific areas, either indefinitely or for fixed periods.

Petroleum Industry

Petroleum companies, in the past, have had undisputed rights of development on leased lands, which reduces the potential for overt conflict, particularly with other primary industry. Pulp and lumber companies, for example, have been compensated when exploration and drilling operations have caused timber losses on their leases. Nonetheless, environmental problems and conflicts have arisen, and must be viewed as serious. The foothills landscape has been scarred by well sites, access

roads, seismic cutlines, and pipeline and power line rights-of-way. Wildlife have been disturbed and their ranges reduced, not just because of the extent of these activities but also because the roads and cutlines open up large tracts to motor vehicles of all kinds (including snowmobiles and all-terrain vehicles). As one consequence, hunting pressures may become excessive. On the positive side, the cutlines do regenerate and they can provide good browsing for ungulates. Even so, it is not uncommon for petroleum exploration and development to result in a reduction of wildlife populations, especially predators such as the grizzly. Finally, there is the risk of pollution through oil spills, leakage and sulphur emissions. The special problems of the last have already been documented in a previous series of ECA public hearings.

The seismic cutlines form the most widespread and disruptive feature of the petroleum industry's impact on the Eastern Slopes. Seismic companies must obtain geophysical licenses and permits from the Department of Mines and Minerals, and are bound by the Department's regulations with respect to the geophysical portion of their operations. In addition, before exploration can be permitted in any "green zone," a letter of permission must be obtained from the Department of Lands and Forests. With this proviso, however, seismic companies are generally given the right to operate on all crown land, with the exception of some restricted areas, such as the Tri Creeks watershed. If the land is already leased to pulp or lumber firms, compensation has to be agreed upon, but exploration is not prohibited. Similarly, on grazing leases the seismic companies may operate along undeveloped road allowances, subject to arbitrated conditions.

The interval between cutlines can be regulated by the Department of Lands and Forests and is not supposed to be less than one-quarter of a mile or, in rare cases, 600 feet. The width is also restricted, to a maximum of 25 feet. In the past, a north-south and east-west grid control pattern was followed, but greater flexibility of orientation is now permitted, to allow the control pattern to be adjusted to local variations in geological conditions. Efforts are now made to ensure that cutlines for different explorations do not duplicate each other, in too close proximity. This was not always the case in the past and it can still be a difficult constraint to impose, particularly when a new grid control pattern is being superimposed on one aligned to the cardinal points.

An inevitable problem of establishing cutlines to conform with grid patterns, however they are oriented, is that they are not sympathetic to terrain variations. This is particularly critical in an area of broken relief, such as the Eastern Slopes. Cutlines cross streams at all angles, and traverse steep slopes, and erosion and siltation are accelerated. Seismic operations and watershed management have frequently been in sharp conflict. The Department of Lands and Forests, though, is now facing up to this problem. Under the Forest and Prairie Protection Regulations 1972, all cutlines must cross streams at right angles and the Department must oe satisfied that erosion is being prevented along them. It would be very desirable to extend these regulations to include such things as the responsibility for revegetation of the cutlines, with due regard for wildlife needs, and prohibitions

or restrictions on the use of the cutlines by motorized vehicles. Erosion and the conflict with wildlife management, through the increased disturbance of animals, are still the most serious problems which are generated by seismic exploration.

Coal Mining

Alberta has very large coal reserves, the current estimate being about 47 billion tons. However, only a small portion of this total (about 2 billion tons) is of coking quality, and it is here that the Eastern Slopes region makes its main contribution. Alberta's proven reserves of coking coal are concentrated along the mountain-foothill boundary zone, from south of Coleman to the B.C. border west of Grande Cache. The total area is not great (about one-half of one per cent of the foothills region), and the principal mining centres (Coleman, Canmore, Luscar and Grande Cache) are widely dispersed, but the local environmental impact is always massive.

Mining in the foothills presents many difficulties. Access is often poor, the coal seams are frequently steeply pitched and of variable thickness, and methane gas is of common occurrence. Recovery levels are therefore low: at Grande Cache, for example, the recovery rate is not much more than half the norm of 57 per cent for underground mining. The recovery rate increases notably for strip mining, but only 7 per cent of the proven reserves of coking coal in the Eastern Slopes are suitable for stripping. In total, only 30 per cent (600,000 tons) of the coking coal reserves is actually recoverable.

Many land use conflicts and problems arise from surface and subsurface mining. Pitheads, railways, spoil heaps and the other character-

istic surface features are very obtrusive and unsightly. Dust and noise pollution are common, and conflict with both wildlife management and recreation. Water and forest management practices can also be interfered with, particularly on the irregular foothills terrain. Forest clearance and mineral working on sloping ground lead obviously to increased instability, accelerated erosion and run-off, and increased siltation of streams. The spoil heaps may also be unstable, with consequent slumping into stream channels. Climate and terrain conspire to make revegetation a slow process; reclamation of spoil heaps and stripped areas is particularly difficult, and there are no records yet of successful reclamation in the sub-alpine zones. Seepage and runoff from coal tunnels and spoil heaps may contain harmful chemical pollutants. In the Coleman area, for example, the coal effluent has a high iron content, which oxidizes and precipitates out onto stream beds: the stream habitats are then damaged or destroyed. Stream turbidity is also increased by the addition of coal dust. Water temperature is increased by the absorption of light energy, algae and plant growth are often increased, and fish mortality may rise. These problems are all heightened by the fact that present and prospective mining are concentrated in areas which are environmentally sensitive - at high elevations, on steep slopes, and at the heads of major watersheds.

Another recurring objection to coal mining is that ungulate wintering ranges are disturbed. This is particularly true for strip mining, with its extensive ground disturbance and its dependence on heavy, noisy equipment. The newly-approved No. 9 mine at Grande Cache, for example,

may eliminate goat and sheep ranges. At this stage, it is impossible to know how damaging the stripping will be but the opportunity should be taken to monitor its effects very closely. There are several other areas in the Eastern Slopes where prime ranges overlie coal leases (e.g. on each side of the Panther River, just outside the Banff National Park boundary; east of the headwaters of the Elbow River; in the Highwood and Sheep River basins; along the upper Oldman River; directly north of Rock Lake, in the Kakwa Falls area; south of Exshaw; and extensively between the Clearwater and Blackstone Rivers). Before development is permitted on any of these leases, their prospective impact on wildlife behaviour and range should be evaluated in the light of the Grande Cache experience. If an animal population is likely to be endangered by a proposed mine, the actual and social costs of the wildlife loss must be weighed against the benefits of coal extraction.

In addition to wildlife analyses, the decision to develop new mines should always require the assurance that permanent environmental damage will not result. In particular, an acceptable reclamation scheme must be part of the development proposal. This has not previously been required of surface mining operations in the forest reserves, a deficiency which has now been rectified in the newly-adopted Bill 47. Although coal mining is comparatively restricted in the Eastern Slopes, its local impact is devastating, and the impact of coal exploration is far-reaching. A more scientific approach to the evaluation of development sites is therefore imperative. In some instances, this could lead to mining being disallowed. Past regulations were not sufficiently comprehensive or forceful. There have been some successes (e.g. prose-

cutions for stream pollution in the Luscar area), but the greater environmental concern demonstrated by Bill 47 must be enforced to be effective.

Forest Industries

The Minister of Lands and Forests, in agreement with pulp and lumber companies, issues leases and licenses to harvest forest products. In the case of the three major firms, the leases apply to extensive areas, known as forest management areas, which have to be managed on a permanent yield basis. Smaller operators work within much more limited areas and are licensed for limited periods. Amongst other things, they must submit an annual operating plan to the Department of Lands and Forests for approval each year. This specifies the amount and location of the harvest, and the technique of cutting (e.g. whether clear-cut, in which all timber is felled, or a selective harvest of a fixed percentage of the timber, or of all timber above a certain size). The Department has also established guidelines for the conduct of the felling operations, and reforestation is controlled by agreement between the firms and the government.

The prospects for enlarging the area of forest industry activities are not great. Future felling will be largely restricted to second-growth forests. Because of the fire history of the Eastern Slopes, most of the timber in the region is immature. There are numerous examples of surviving stands of mature timber, but in total they extend to only about 10 per cent of the land area. Any harvesting of this mature timber should be done with great care. It should be phased to ensure a continuous supply of maturing trees, and it should be timed to avoid the deterioration which accompanies over-aging.

As with other resource industries, the principal conflicts are likely to be with wildlife and watershed management. Some are common to all the industries (e.g. the problems of erosion, siltation and wildlife disturbance that can accompany the opening of roads and cutlines); others are unique to the forest industry. If, for example, designated trapping areas are cut over, the populations of fur-bearing animals will be affected for many years. Current clear-cutting practices also have obvious implications for ungulate populations. While clear-cut blocks are generally limited to maxima of 80 acres for pine and 40 acres for spruce, the block size on the pulp leases has sometimes been increased to 500 acres and 250 acres respectively. Moreover, the intervening uncut strips have sometimes been cleared before the original blocks have regenerated. The larger clearings may be frightening to animals, causing them to abandon the area; the possibility of wind erosion and damage to seedlings is also enhanced. On the positive side, small clear-cut areas can produce desirable forage, and their fringes provide good shelter.

Conflicts between forestry and other industries are minor, but they can still assume local importance. When seismic cutlines continue to be used as trails, for instance, forest regeneration is likely to be hindered. The same is true if cattle and horses are permitted to graze on cut-over land (especially in the north); this may be a problem on the Northwest Pulp and Power lease, particularly between highway 16 and the Athabasca River. The construction of forestry roads may also be restricted on grazing leases which are situated within forest management areas. Conversely, oil and gas exploration and development may require the clearance of forest for access roads and power and pipe lines; the Forest Act does provide for compensation, but only if

more than one per cent of the lease is cleared. The whole question of access roads, for all purposes, in forest management areas is a worrisome one: much firmer action is needed to restrict their numbers and to ensure their eventual reclamation.

Pollution is not a serious problem in the forest industry, generally. Pulp mill effluents are the most likely offenders, and warrant close regulation. Foam and discoloration, for example, can be observed in the Athabasca River below Hinton and, although the emissions are not greatly in excess of the maxima set by provincial regulations, the scientific validity of these maxima has not been seriously measured.

A final and rather different use conflict is that posed by recreation. Mature forest areas are highly attractive for most forms of outdoor recreation, particularly if they are combined with interesting terrain and water. At the same time, however, intensive recreation is incompatible with commercial forest management. One common response is exemplified by Proctor and Gamble which has reserved 3000 acres at Kakwa Falls and Two Lakes for public recreation. Much larger reserves are in demand, though, and the recreational pressures on the forest management areas are bound to become more urgent. The demand for continued high wildlife production may also put increased pressure on the forest industry to design and regulate its management practices to optimize this benefit.

Wilderness

The notion of wilderness preservation has been given legal force in the Eastern Slopes region, under two separate pieces of legislation.

The first set up the Willmore Wilderness Provincial Park; the second, the White Goat, Siffleur and Ghost River Wilderness Areas. This dualism reflects some of the confusion which afflicts the wilderness concept, wherever it has been applied. For example, can a "wilderness" also be a "park," or are the two inherently incompatible? Should a "wilderness" be preserved, intact and unaltered, no matter what resources it contains, or can resource exploitation be accepted if the area is restored to a near-natural state? There are no scientific answers to such questions, and there is no single concept of wildenness. The definition of the nature and purpose of wilderness is a reflection of the values and attitudes of society at a particular time.

Insofar as there is agreement on a wilderness concept, it would emphasize preservation of the existing environment, the prevention of development, restricted and motorized access and severely limited use. The Alberta Wilderness Act prohibits hunting, horse-travel, fishing and berry-picking, as well as all motorized access and industrial disposition. The Willmore Wilderness Provincial Park is not so restricted, however: it is open to the non-mechanized forms of recreation which are prohibited in the Wilderness Areas. Also, mining companies have been given sub-surface rights and exploration privileges, and roads have been constructed, with the approval of the Department of Lands and Forests. Further development has recently been frozen to allow the government to review the purpose of the park. Similar development pressures are being experienced elsewhere, particularly in <u>de facto</u> wildernesses which have not yet been given legal protection.

If it is accepted that wilderness preservation is a desirable goal, the Eastern Slopes have a major prospective role. In selecting wilderness areas for special protection, though, two general considerations should be kept in mind.

(i) Areas should not be designated simply because they are on undeveloped, inaccessible crown land. There should first be something worth preserving, such as a high potential for wildland primitive recreation or a special wildlife habitat. It has been stressed repeatedly in this report that the greatest conflicts generated by resource development are in the form of aesthetic, wildlife and watershed disturbances. Wilderness can provide an opportunity to protect endangered plant and animal species, or to secure sensitive watersheds, or to satisfy several forms of primitive recreation. It is possible to designate different types of wilderness, to serve different purposes. In all cases, though, the appropriateness of the wilderness designation must be determined through detailed scientific analyses.

(ii) It must be possible to eliminate all present or potential use conflicts, not just within the wilderness but in adjacent areas which could affect it adversely. For example, there seems little point in designating the lower portion of a stream basin as wilderness if the headwaters of the stream are not also under a development ban. Similarly, the designation of a wilderness area must entail a clear commitment to sterilize any resources whose exploitation could result in environmental damage or deterioration. Some exploitive activities (e.g. grazing, trapping or outfitting) might be permissible in some types of wilderness, but not in others (e.g. in a recreational wilderness, but not in

a wilderness which is being protected for scientific reasons).

Recreation

In terms of number of people involved, dollar value and prospective growth, there can be no doubt that recreation is potentially the most significant activity in the Eastern Slopes region. Many factors contribute to this. On the demand side, there are such things as increased leisure time, increased mobility, increased discretionary incomes and larger urban populations. On the supply side, there is the natural attractiveness of the Eastern Slopes - its hills, forests, lakes, streams and wildlife. A wide variety of recreational activities are possible in the area, from wilderness travel by horse and foot to automobile touring with luxury accommodations. By virtue of its proximity to some of the most celebrated national parks in the world, and its inherent appeal as one of the few remaining, comparatively unspoiled "frontiers," the Eastern Slopes region has the potential to draw visitors from all over North America. The main pressure, though, is likely to continue to come from Albertans who are seeking an outdoor experience under near-natural conditions. Camping, fishing, hunting, canoeing, hiking, trail-riding, snowmobiling and skiing will probably continue to be the activities most in demand. It is also evident that a substantial new demand is emerging, for the construction of large-scale commercial recreational facilities. These are intended to provide a variety of activities, not all of which are intimately linked with the special qualities of the Eastern Slopes environment (e.g. golf courses and swimming pools).

Some of the problems which are posed for recreationists have been mentioned in previous sections. Very frequently, recreation is incompatible with resource exploitation. The relationship is a two-way one: resource exploitation depletes the environmental qualities which are attractive to recreationists, and recreational demands can be a hindrance to industry.

Another dimension of the environmental problem generated by recreation is one which has already been experienced in many parts of the world - overuse. This is evidenced in many ways but most particularly in congestion and environmental degradation. In short, the quality of the recreational experience is weakened or destroyed by its very popularity. The problem has many manifestations, any one of which may be enough to spoil a particular recreational outing - the frustrations and hazards of driving on congested highways, of inadequate accommodation, of crowded service facilities, of fished-out streams and of polluted water and beaches; the degradation, even the destruction, of trails and vegetation; and the disruptions of wildlife behaviour leading, in its extreme form, to outright conflict (e.g. with bears in national park campsites). These sorts of problems are in their infancy in the Eastern Slopes, but they are already beginning to assume serious proportions at peak recreational periods, such as holiday weekends in summer. Recreation is just as likely to conflict with sound environmental management as any of the more obviously exploitive industries. It is no more proper to assume that uncommitted crown land can automatically be turned over to recreation than to lumbering or grazing.

This leads to the important point that recreation is an economic activity, just as the extractive and agricultural industries are. What-

ever its physical and spiritual benefits, recreation can also be an important contributor to the regional economy. It can generate income and employment, and creates heavy demands for services and facilities of many kinds. One unfortunate result is that the potential for conflicts is exacerbated. Those businessmen who have invested in the recreation industry must wish to pursue their completely legitimate goal of maximizing profits - which may require them to advertise widely, in the attempt to bring in as much tourist custom as possible. But the provision of services and facilities oriented mainly to out-of-province vacationists may not be in the best interests of Alberta residents, whose chief demand is for day or weekend recreation. By and large, elaborate facilities are not needed for a local market. Some facilities may have to be provided (e.g. ski tows, overnight accommodation) but not on the scale or in the variety that is needed to attract more distant visitors. It is also worth noting that recreational expenditures within the day and weekend trip zones, though substantial, accrue largely to businessmen in the home city (e.g. purchases of equipment and supplies): expenditures at the recreational site are minimal, and are usually limited to convenience services. Moreover, on-site expenditures at large resorts experience a high rate of "leakage." Because of a high proportion of absentee owners, and the use of seasonal labour, much of the income generated by the recreational facilities is exported from the region in the form of salaries and profits. Thus, economic arguments can be misleading. Unless the recreational facilities cater to large numbers of tourists, they are not likely to have a great impact on the local economy of the recreational site. But to cater deliberately to large numbers

of out-of-province visitors, for economic reasons, may alienate resources that are important to Albertans, for non-economic reasons. The basic question is whether the Eastern Slopes region can provide for both local and non-local recreation, on the scale that will be demanded by an increasingly space-hungry population, without Albertans becoming second-class citizens in their prime recreational region.

To summarize, recreational conflicts fall into four general classes.

(i) Recreation competes with other economic activities for a share of a finite land resource. This competition is intensified in those comparatively few areas (e.g. lakeshores, ski slopes) which have the capability to attract a high intensity of recreational use. In some instances, this competition has already produced overt conflicts, most blatantly in such things as accidental forest fires. Because the Eastern Slopes region has a high recreational potential, and because there is no apparent slackening of the growth in demand for outdoor recreation space, the competition and conflicts are bound to intensify.

(ii) Some recreational uses may conflict with wildlife management and wilderness preservation, whether it be for scientific or recreational purposes. For many people, the primary reason for visiting wilderness is to obtain a special type of recreational experience, be it nature study, or hunting or fishing, or hiking or trail-riding. Again, there are some blatant conflicts. Poorly regulated hunting can limit the opportunity for wildlife observation. The ready availability of all-terrain vehicles extends the potential range of penetration into the

back-country Eastern Slopes, thus limiting the chance for solitude, or a high-quality trip for those who prefer to travel by foot or horse. The seasonal distribution of use has also been transformed, by the snowmobile. If unrestrained access continues to be permitted to all areas of de facto wilderness, wildlife disturbance must inevitably increase, through increased hunting pressure and through harassment, whether deliberate or unintentional (e.g. because of noise).

(iii) There is already competition, and increasingly there will be conflict between local and non-local recreation demands. To a large extent, this competition is expressed in the distinction between commercial and public facilities. It takes two forms: the danger that prime sites will be pre-empted for commercial developments, and will thus become alienated as far as most Albertans are concerned; and the additional contribution to the down-grading of the recreational experience, through congestion and environmental degradation. The growing competition for space is now becoming very plain, in the commercial proposals which have been received by the Environment Conservation Authority and in the various lobbies for new provincial parks (e.g. at Kakwa Falls-Two Lakes, the Clearwater River and the Crowsnest Pass) or wildland recreation areas.

(iv) Recreation creates its own internal conflicts, particularly through overuse of resources and facilities. Some recreational activities are also incompatible with each other: snowmobiling and cross-country skiing, for instance, or power-boating and swimming, cannot share the same space. And, as a final example, there is the conflict between the solitary and the gregarious types of recreationists. A great deal of the charm of

the Eastern Slopes, under present conditions, is that solitude can still be enjoyed through much of its area. But other recreational demands, as well as the non-recreational ones, are increasingly importunate. In future, the luxury of solitude may be possible only in the designated wildernesses, and the numbers of people who can be permitted to enjoy this luxury will have to be stringently controlled, if the wildernesses are not to lose their essential purpose.

SOME CONCLUSIONS AND RECOMMENDATIONS

It is not pretended that this report contains a complete and detailed inventory of resource development and land use conflicts in the Eastern Slopes region. Nonetheless, it is clear that many conflicts do occur already. Some are potentially very serious, as the competing pressures on this valued area increase. The Eastern Slopes region is very important to Albertans in many ways; it contributes much to the satisfaction of economic, social, personal, and aesthetic needs of many kinds. In the space-hungry world of the future, the variety and intensity of the demands on its fixed resources may well assume crisis proportions. Many different human activities can logically claim a place here, and legitimately expect to be accommodated. It would be unrealistic, for example, to expect the foothills to become one huge playground for urban Alberta, though the case could undoubtedly be argued. Careful judgments will have to be made among the alternative, competing users. Priorities will have to be established, clearly and fairly, and then adhered to in planning and management decisions. The principles and concepts set out in the opening section of this report will have to become paramount. Above all,

it will have to be accepted, and be seen to be accepted, that the long-term interests, wants and needs of Albertans are of first priority.

This is not to suggest that there has not been a great deal of governmental energy, enthusiasm and expertise devoted to the region already. On the contrary, government's concern for the management of the region's resources has resulted in a plethora of legislation, regulations, agreements, licenses and permits. Some of these controls are excellent; others can be criticized in various ways. The more critical problem, though, is the complete failure to integrate all these controls into a cohesive and comprehensive policy for the whole region. They stand, at the moment, as a bewildering fragmented array, each developed in isolation from all the others. If this procedure is followed for much longer, the long-term prospects for wise planning and management of the total region for all Albertans will be seriously undermined. An eminent geographer, Sir Dudley Stamp, once defined planning in a way which cut to the heart of the Eastern Slopes issue: "land planning," he wrote, "is the right and balanced allocation of land between rival claimants.... The planner's task is to determine the optimum use, in the national interest, of every acre of the surface." It is precisely this dimension of planning which is missing in the Eastern Slopes - the dimension of determining which, among a variety of competing uses, represents the optimum use. By and large, in the past, these choices have not been needed. Now, however, they are imperative.

In conclusion, four broad recommendations are advanced.

(i) A holistic approach must be taken to the future management of the Eastern Slopes. That is, plans must be developed for the total region,

in all its dimensions. At present, many different governmental agencies have some responsibility in the region, but no agency is serving in an effective co-ordinating capacity. As just one example, the staff of the Multiple Use Planning Section of the Alberta Forest Service have prepared a map of all the leases which are currently held in the Eastern Slopes. This summarizes the jurisdictional overlaps and land use conflicts which are bedevilling the region. It is urged that this map be made available to the Environment Conservation Authority.

(ii) Because the Eastern Slopes region is still largely owned by the provincial government, there is an unrivalled opportunity for effective long-term planning in the public interest. There is also an unrivalled opportunity for completely open planning, not just in the sense of full and free public participation in the planning process, but also to ensure that management decisions are exposed to public scrutiny at all stages. One preliminary step is strongly urged. Many present officials are intimately acquainted with the Eastern Slopes region, and the policies and regulations which apply to it. It is essential that they have the opportunity to speak freely at the public hearings.

(iii) Many past management decisions, if not all of them, have been made with inadequate scientific information on the probable environmental consequences. There are signs that this attitude is breaking down (e.g. in the freeze on surface development in the Willmore Wilderness Provincial Park), but there can be no excuse for allowing it to continue at all. Planning and management decisions should be preceded by

thorough environmental analyses. The effects of the decisions should also be monitored closely to provide scientific feedback for further decision-making. The impact of strip-mining at Grande Cache on sheep and goat behaviour is a case in point.

(iv) A land use zoning plan should be developed for the whole Eastern Slopes region, as a first priority. At a general level, this could set out the broad categories of use which would be permitted over large areas. For example, there could be primary industry zones, grazing zones, recreation zones, wilderness zones and, possibly, mixed zones, where two or more of the general use categories could be accommodated. In many areas, more than one use may be possible, but in some (e.g. a strip mining area or a wilderness set aside for scientific purposes) multiple use would not be possible or acceptable. At a larger scale, treating sub-units within the region, more detailed zoning could be provided for smaller land units. For example, the exact extent of an approved coal-mining zone could be designated, and precise recreational sites could be identified, classified according to their most appropriate uses. The planning process, of course, would have to include a mechanism for continuous appraisal and feedback, to accommodate new needs and the experience of working with the zoning plan.

APPENDIX I - PUBLIC AND PRIVATE AGENCIES FROM WHICH INFORMATION WAS OBTAINED

Alberta Fish and Game Association
Alberta Forest Service
Alberta Snowmobile Association
Alberta Wilderness Association
Canadian Wildlife Service
Canadian Youth Hostel Association
Canfor Lumber Company, Grande Prairie
Chamber of Commerce, Red Deer
Coleman Colleries, Coleman
Community Services, Grande Cache
Crowsnest Pass Tourist Association
Department of Agriculture, Province of Alberta
Department of Fish and Wildlife, Province of Alberta
Department of Lands and Forests, Province of Alberta
Department of Mines and Minerals, Province of Alberta
4-H Club
Government of Canada Research Station, Lethbridge
Grande Prairie Regional Co-ordinating Authority
Imperial Lumber, Grande Prairie
North West Pulp and Power Company, Hinton
Oldman River Regional Planning Commission
Peace River Regional Planning Commission
Proctor and Gamble Company of Canada
Provincial Park Committee of Crowsnest Pass
Red Deer Regional Planning Commission
Research Council of Alberta
Swan City Snowmobile Club
Travel and Convention Association of Alberta
Trumpeter Swan Trailer Club
Unifarm
Western Stock Growers Association
Wild Kakwa Group, Grande Prairie

APPENDIX II BIBLIOGRAPHY

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APPENDIX III - GOVERNMENT OF THE PROVINCE OF ALBERTA, ACTS AND REGULATIONS WITH SOME APPLICATION TO THE EASTERN SLOPES REGION

Clean Water Amendments Act, 1972
Coal Mines Regulations Act, 1955
Department of the Environment Act, 1971
Department of Highways and Transport Act, 1965, as amended in 1969
Eastern Rockies Forest Conservation Agreement Amendment Act, 1957
Energy Resources Conservation Act, 1971
Environment Conservation Act, 1970
Environment Conservation Authority Act, 1972
Expropriation Procedure Act, 1972
Forest Acts, 1961, with amendments to 1967
Forest and Prairie Protection Act, 1971
Forest Reserves Act, 1964
Ground Water Control Act, 1953
Hydro and Electric Energy Act, 1971
Land Surface Conservation and Reclamation Act (Date of Proclamation to be set)
Mines and Minerals Act, 1962, as amended in 1968
Oil and Gas Conservation Act, 1969
Pipe Line Act, 1958
Provincial Park Lands Act, 1964, as amended in 1972
Public Highway Development Act, 1966
Public Lands Act, 1966, as amended in 1963, 1970 and 1971
Quarries Regulation Act, 1950
Right of Entry Arbitration Act, 1955, as amended in 1968
Water Resources Act, 1970, as amended in 1972
Wilderness Areas Act, 1970, as amended in 1972
Wildlife Act, 1970, as amended in 1972
Willmore Wilderness Park Act, 1959, as amended in 1965